

**Table S2.** Contents of major elements (wt.%) in amphiboles of the magmatic rocks of the Tommot and Somnitelnyi massifs

Rock	peridotite			feldspar jacupirangite			essexite			hornblendeite			toensbergite			pulaskite	
Sample	V17/1			V15/2			V9/3			V9/1			V12/9			V24/3	
SiO <sub>2</sub>	38.48	39.91	38.29	39.54	40.60	38.29	38.11	38.23	39.45	37.89	40.28	39.64	39.87	40.55	39.23	43.97	37.48
TiO <sub>2</sub>	4.13	3.75	6.49	4.97	5.31	6.49	5.03	0.65	4.79	4.01	4.40	2.94	1.41	4.08	4.61	2.73	8.11
Al <sub>2</sub> O <sub>3</sub>	14.29	13.14	13.46	13.76	13.43	13.46	14.63	11.69	14.35	13.94	12.02	12.05	9.78	13.22	12.96	8.45	12.25
Cr <sub>2</sub> O <sub>3</sub>	-	-	-	-	-	-	0.02	0.04	0.02	-	-	0.05	0.01	-	-	-	-
Fe <sub>2</sub> O <sub>3</sub>	1.89	-	1.44	-	-	1.44	-	-	2.94	4.66	2.15	2.46	1.76	-	-	-	0.25
FeO	12.18	14.37	9.09	11.19	11.09	9.09	11.72	30.27	12.21	11.25	14.85	13.74	27.40	12.93	13.26	7.55	11.41
MnO	0.21	0.26	0.20	0.16	0.14	0.20	0.11	1.36	0.27	0.26	1.09	0.29	1.18	0.25	0.22	0.17	0.16
MgO	10.87	9.68	13.25	11.20	11.08	13.25	11.63	1.03	10.01	10.08	9.13	9.97	1.97	10.95	10.12	11.90	12.63
CaO	11.64	11.63	11.99	11.83	11.68	11.99	11.96	8.37	10.68	10.85	11.21	11.23	9.94	11.74	11.95	21.99	11.97
Na <sub>2</sub> O	2.47	2.55	2.31	2.57	2.48	2.31	2.52	2.97	2.64	2.50	2.12	2.20	2.96	2.63	2.73	0.79	2.56
K <sub>2</sub> O	1.08	1.13	1.08	0.96	0.91	1.08	1.09	3.06	1.14	1.22	1.34	1.51	1.79	1.29	1.22	-	0.79
H <sub>2</sub> O	1.79	1.89	1.90	1.50	1.90	1.90	1.77	1.28	1.77	1.64	1.77	1.41	1.75	1.89	1.88	1.79	1.77
F	0.16	-	-	0.32	0.59	0.42	0.42	0.83	0.28	0.72	0.14	0.60	0.50	-	0.79	0.42	0.25
Cl	0.03	0.02	-	-	0.02	0.01	-	0.30	0.04	0.02	0.14	0.63	0.14	-	-	-	-
Σ	98.22	98.33	99.50	95.00	99.21	99.93	99.01	100.08	100.79	99.34	100.64	98.72	100.45	99.53	98.49	99.76	99.63
Si	579	6.08	5.68	5.96	6.05	5.68	5.73	6.17	5.86	5.76	6.07	6.10	6.43	6.06	5.98	6.36	5.62
Al <sup>4+</sup>	2.21	1.92	2.32	2.04	1.95	2.32	2.27	1.83	2.14	2.24	1.93	1.90	1.57	1.94	2.02	1.44	2.16
Al <sup>6+</sup>	0.32	0.44	0.04	0.40	0.41	0.04	0.33	0.4	0.37	0.26	0.20	0.28	0.29	0.39	0.31	-	-
Ti	0.47	0.43	0.72	0.56	0.6	0.72	0.57	0.08	0.53	0.46	0.50	0.34	0.17	0.48	0.53	0.30	0.91
Fe <sup>3+</sup>	0.21	-	0.16	-	-	0.16	-	0.81	0.33	0.53	0.24	0.28	0.21	-	-	-	0.03
Fe <sup>2+</sup>	1.53	1.83	1.12	1.41	1.38	1.12	1.47	3.27	1.52	1.43	1.87	1.77	3.69	1.62	1.69	0.91	1.43
Mn	0.03	0.03	0.03	0.02	0.02	0.03	0.01	0.19	0.03	0.03	0.14	0.04	0.16	0.03	0.03	0.02	0.02
Mg	2.44	2.20	2.93	2.49	2.46	2.93	2.61	0.25	2.22	2.28	2.05	2.29	0.47	2.44	2.30	2.56	2.82
Ca	1.88	1.90	1.91	1.91	1.86	1.91	1.93	1.45	1.70	1.77	1.81	1.85	1.72	1.88	1.95	2	1.92
Na	0.72	0.75	0.66	0.75	0.72	0.66	0.74	0.93	0.76	0.74	0.62	0.66	0.93	0.76	0.82	0.22	0.74
K	0.21	0.22	0.26	0.18	0.17	0.26	0.21	0.63	0.22	0.24	0.26	0.30	0.37	0.25	0.24	-	0.15
F	0.08	-	-	0.15	0.29	0.20	0.20	0.42	0.13	0.35	0.07	0.29	0.25	-	0.38	0.19	0.12
Cl	0.01	-	-	-	-	-	-	0.08	0.01	0.31	-	0.16	0.07	-	-	-	-
O=f, Cl	-0.07	-	-	-0.13	-0.25	-0.18	-0.18	-0.42	-0.13	-0.31	-0.09	-0.39	-0.24	-	-	-0.18	-0.11
Fe/(Fe+Mg)	0.41	0.45	0.30	0.36	0.35	0.30	0.36	0.94	0.45	0.45	0.50	0.46	0.89	0.39	0.42	0.26	0.34
P, kbr	7.6	5.8	5.7	6.7	5.9	5.7	7.9	-	7.1	7.0	4.1	4.4	-	5.6	5.2	4.3	4.3
T°C	1042	1002	1071	1042	1027	1071	1070	-	1014	1024	964	968	-	1012	1001	1037	1037
Log f O <sub>2</sub>	-10.2	-11.8	-9.7	-10.4	-10.8	-9.7	-9.9	-	-11	-10.5	-11.9	-11.8	-	-10.8	-11.6	-9.3	-9.4
H <sub>2</sub> O in melt %	6.7	5.3	4.3	7.4	7.4	4.3	6.2	-	6.6	6.0	5.4	4.9	-	6.0	6.1	7.3	6.0
mineral	pargasite			kaersutite			taramite			kaersutite			magnesiogastingsite			ferro-pargasite	
																kaersutite	
																cannilloite	
																kaersutite	

**Table S2.** Contents of major (wt.%) elements in amphiboles of the magmatic rocks of the Somnitelnyi massifs (continuation).

Rock	granites					albitites				pegmatites		
Sample	PR26/7a		V29/3	PR6-4b		PT5	PR14/3a		PR24/4a	V3/12		
SiO <sub>2</sub>	39.66	40.43	38.57	52.51	37.42	49.73	51.26	54.23	50.49	39.96	40.27	52.00
TiO <sub>2</sub>	0.43	0.41	5.23	0.44	6.05	0.33	0.35	0.27	0.28	1.79	0.90	0.73
Al <sub>2</sub> O <sub>3</sub>	11.43	11.39	12.53	2.08	8.45	0.81	0.88	4.46	1.72	11.03	10.68	0.35
Cr <sub>2</sub> O <sub>3</sub>	-	-	-	-	-	-	-	-	0.02	-	-	0.06
Fe <sub>2</sub> O <sub>3</sub>	3.54	4.37	-	-	-	-	-	-	-	3.15	3.31	-
FeO	18.57	18.00	12.26	19.60	28.11	22.13	21.07	24.77	20.95	25.65	22.93	29.84
MnO	0.34	0.33	0.21	2.12	1.94	4.95	3.81	0.20	4.70	1.25	0.97	0.62
MgO	6.79	6.98	11.24	7.81	2.08	4.07	4.67	0.09	5.84	2.01	3.90	0.06
CaO	10.28	10.27	11.95	2.52	11.27	0.61	0.55	0.42	1.45	9.82	9.78	0.52
Na <sub>2</sub> O	2.84	2.45	2.81	7.07	2.34	9.00	7.73	14.00	7.32	2.59	2.92	12.84
K <sub>2</sub> O	2.05	2.39	1.01	2.39	1.24	2.37	2.87	-	2.01	1.88	1.81	-
H <sub>2</sub> O	1.54	1.52	1.85	1.26	1.64	0.01	1.59	1.85	1.78	1.69	1.74	1.74
F	0.49	0.56	0.23	0.77	0.20	1.40	1.69	0.05	1.00	0.14	-	0.07
Cl	0.04	0.10	-	0.02	0.09	0.68	0.01	-	-	0.07	0.08	-
Σ	98.00	99.20	97.89	98.59	100.83	97.09	96.48	100.34	97.56	101.03	99.29	98.83
Si	6.28	6.32	5.89	7.98	6.05	8.00	8.00	8.00	7.91	6.32	6.40	8.00
Al <sup>4+</sup>	1.72	1.8	2.11	0.02	1.61	-	-	-	0.09	1.68	1.60	-
Al <sup>6+</sup>	0.42	0.42	0.15	0.35	-	0.16	0.17	0.80	0.23	0.38	0.40	0.07
Ti	0.05	0.05	0.60	0.05	0.74	0.04	0.04	0.03	0.03	0.21	0.11	0.09
Fe <sup>3+</sup>	0.42	0.51	-	0.10	-	-	-	-	0.67	0.37	0.40	-
Fe <sup>2+</sup>	2.46	2.35	1.57	2.40	3.80	3.02	2.80	3.14	2.07	3.39	3.05	3.98
Mn	0.05	0.04	0.03	0.27	0.27	0.68	0.52	0.03	0.62	0.17	0.13	0.08
Mg	1.60	1.63	2.56	1.78	0.50	0.99	1.12	0.02	1.36	0.47	0.92	0.01
Ca	1.74	1.72	1.96	0.41	1.95	0.11	0.10	0.07	0.24	1.66	1.66	0.09
Na	0.87	0.74	0.53	2.08	0.73	2.85	2.42	4.11	2.22	0.79	0.90	3.97
K	0.41	0.48	0.20	0.47	0.26	0.49	0.59	-	0.40	0.38	0.37	-
F	0.25	0.28	0.11	0.37	0.10	0.72	0.86	0.89	0.50	0.07		0.88
Cl	0.01	0.03	-	-	0.02	0.19	-	0.01	-	0.02	0.02	0.02
O=F, Cl	-0.22	-0.26	-0.10	-0.21	-0.10	-0.74	-0.71	-0.79	-0.42	-0.07	-0.02	-0.75
Fe/(Fe+Mg)	0.64	0.63	0.38	0.57	0.65	0.75	0.71	0.99	0.66	0.88	0.80	0.99
P, kbr	7.3	7.1	8.0		4.3					6.8	6.5	
T°C	943	937	1001	700	801	687		687	700	761	766	
Log f O <sub>2</sub>	-11.6	-11.8	-8.7		-10							
mineral	gastingsite		kaersutite		ferroeckermannite			arfvedsonite		ferropargasite		ferroeckermannite

*Notes:* the analyses were performed by L.A. Pavlova and S.P. Roev at IGABM SB RAS using the Camebax-micro x-ray microanalyzer.  
Calculations of crystallization parameters by [34, 35].